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Differential-algebraic systems with symmetry structures

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Linear time-varying differential-algebraic equations with extra symmetries such as self-adjoint and skew-adjoint systems are studied. Local and global canonical forms under congruence are presented and used to classify the geometric properties of the flow associated with the differential equation as symplectic or generalized orthogonal flow. As applications, the results are applied to the analysis of dissipative Hamiltonian systems arising from circuit simulation and incompressible flow.

Joint work with Peter Kunkel.

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